

NOTES

ANOTHER brilliant synthesis has recently been accomplished in the domain of organic chemistry; Messrs. Grimaux and Adam have succeeded in building up citric acid from glycerin. We shall give full details next week. Curiously enough, in the last number of the Berlin *Berichte*, Kekulé announces that he has been working at the same subject, but by a totally different method. Kekulé's work is not sufficiently advanced for him to say positively that his method of synthesis is successful, but he feels justified in saying that very probably the process adopted by him has resulted in the formation of citric acid.

THE death is announced of Dr. Hofrath von Wagner, Professor of Technological Chemistry in the University of Würzburg, and the author of several works on that science, chief of which is "Jahresberichte über Chemische Technologie" and "Handbuch der chemischen Technologie," translated into English by Mr. Crookes. He was born at Leipsic in 1823, and first taught in Nüremberg.

THE credit of the invention of binocular glasses has usually been assigned to a certain Bohemian friar, Father de Rheita, who died at Ravenna in 1660. His treatise, which bears the quaint title of "Oculus Enoch et Eliæ," was published at Antwerp in 1645. In 1677 there appeared at Paris a volume entitled "La Vision parfaite," by another ecclesiastic, Père Cherubin of Orleans, which contained an account of some improvements on de Rheita's discovery, illustrated by excellent copper-plate engravings. Lately however Signor Govi has unearthed in the Bibliothèque nationale a printed document which proves the antiquity of binocular glasses to be a little more remote. This document is a placard by one D. Chorez of Paris, who lived on the island of Nôtre-Dame, at the sign of the "Compas." The placard is in old French, and is headed "Av Roy"; it states that the "admirable lunettes" it describes, and which are represented by accompanying figures, were invented by Chorez and dedicated to the king in 1625.

IN the placard of the optician Chorez referred to, the address actually printed was "la rue de Perigneux aux Marais du Temple"; but these words have been struck out with a pen, and above is written "Lisle nostre Dame." The incident is curious as showing that two centuries and a half ago the same quarters of Paris were frequented as now by the instrument-maker. M. Salleron is in the Rue Parée du Marais; M. Lemaire a little farther north, just out of the *Quartier du Temple*, in the Rue Oberkampf. On the island of Nôtre-Dame the opticians elbow one another in shoals, not to omit M. Bregnet's modest shop. The only district of Paris which can, indeed, compete with these being the *Quartier Latin*, where instrument-makers of all kinds abound.

WITH regard to the announcement in an enterprising provincial contemporary of a projected "Natural History Survey of India," the general conduct of which is to be intrusted to Dr. George King of the Botanical Gardens, Calcutta, we believe that those most concerned know nothing which affords any foundation for the statement. The notion is intrinsically improbable, inasmuch as the "Flora of British India," which is in process of preparation at Kew, and of which the third volume is now in course of publication, covers the same ground. It would be inexpedient for the Government to take any step of the kind as far as botany is concerned till the material collected by Indian botanists since the beginning of the century has been fully worked up, and this is being rapidly proceeded with under the direction of Sir Joseph Hooker, assisted by Mr. C. B. Clarke of the Bengal Education Department, who has been detached on duty at Kew for the purpose.

THE case recently reported in the newspapers of poisoning by American tinned beef is calculated to arouse much alarm in the minds of those who use tinned meats. According to the newspaper report of the inquest, no direct evidence was given that poisoning was actually due to zinc or other metallic poison; in the present state of knowledge the explanation referred to by Mr. Dyer in his letter to the *Daily News*, viz., that it was due to the unwholesome state of the meat itself, and not to metallic poison absorbed from the tin, seems the most probable. Nevertheless, a series of well-conducted experiments, undertaken by some of the companies whose trade in these meats is so large, on the action of meat juices on tin and on solder, might do much to allay suspicion, and at the same time to advance our knowledge of natural facts.

IN the last session of the United States Congress at Washington, May 24, 1880, the "Committee on Naval Affairs" reported a bill in support of a proposed International Commission to agree upon standard tests for colour-blindness and visual power in navies and merchant marines, and standard requirements of these faculties. Resolutions in recommendation of this Commission have been passed by the American Ophthalmological Society at their Newport meeting, the Ophthalmological Section of the British Medical Association at Cambridge, and the International Congress of Ophthalmology at Milan. The next United States Congress will act on this bill to initiate the Commission. Dr. R. Joy Jeffries, 15, Chestnut Street (Beacon Hill), Boston, Mass., U.S. America, intimates that he will be greatly indebted for any public or private statistics or information in relation to this subject which any one can send him.

MR. ADAM SEDGWICK, who was elected a Fellow of Trinity College, Cambridge, on Saturday last, the 9th inst., graduated in the First Class of the Natural Sciences Tripos of 1877, when he was especially distinguished for his knowledge of zoology and comparative anatomy, human anatomy and physiology. Those of our readers who are interested in the study of the principle of heredity may be glad to know that this gentleman is the great-nephew and eldest male representative of the illustrious geologist whose name he bears.

IN reference to our note (*NATURE*, vol. xxii, p. 541) upon the awards of the juries of the Exhibition of Agriculture and Insectology at Paris, wherein we observed that a suggestion had been put forward to arrange the electric light as an insect-catcher, a correspondent writes that in experimenting for other purposes with a Browning electric light upon a roof at Charing Cross, besides innumerable flies and moths, single individuals of two species of sphinxes were attracted, probably from considerable distances.

THE Freedom of the City of London was conferred on Sir Henry Bessemer on Wednesday last week. Sir Henry in his address indicated the vast improvements which his process had introduced in the manufacture of steel, and at the dinner in the evening he sketched the early progress of iron manufacture.

THE French Minister of Public Instruction has caused an edition of Mr. Herbert Spencer's work on Education to be published for gratuitous distribution in France.

A PRACTICAL experiment was, on Wednesday last week, tried with the air-engine at Woolwich, designed by Col. Beaumont, Royal Engineers, and which has been for some time running on the short lines of the Royal Arsenal. Although weighing but 10 tons, it has proved capable of hauling a burden of 16 tons up a fair incline, and arrangements were made to try its powers in a more extended run, such as engines of the kind would have to encounter on the London railways and tramways. The air-reservoir, which contains only 100 cubic feet of air, was charged at the torpedo pumping-house, up to pressure of 1,000 lb. to

the square inch, and with this store of energy it was proposed to run to and from Dartford, about 16 miles. The chief feature of Col. Beaumont's method is the introduction of an almost imperceptible supply of steam, by which the air, as it is admitted to the cylinder from the reservoir, is largely heated, and thereby greatly increased in force. The engine is driven by six cylinders and a double set of machinery at one end, and, having no smoke-stack, resembles in appearance a locomotive tender rather than a locomotive. It runs on four wheels, and in size is less than that of an ordinary omnibus. It left the Royal Arsenal at Plumstead Station at 12.22 p.m., with a full charge of 1,000 lb. to the inch, passed Abbey Wood Station at 12.27 with 940 lb. on the gauge; Belvedere at 12.33, with 8.60 lb.; and Erith at 12.36, with 760 lb., arriving at Dartford at 12.50, with a remaining energy of 540 lb. on the square inch. Shunting about at the station reduced this pressure somewhat, and at 1.35 the return journey commenced with a store of 510 feet. Although the minimum for effective working is considered to be a pressure of 200 feet, Plumstead station was reached again at 2.10, but the engine was nearly pumped out, having a pressure of barely 80 lb. remaining. It was stated that another engine was being constructed, much more powerful; capable, in fact, of travelling double the distance with a single charge. The operation of pumping in the compressed air occupies about fifteen minutes, and it is calculated that an air engine on this principle as large as the usual steam locomotive of 50 tons weight would be considerably more powerful than any locomotive yet made. The objection to steam, that it frightens horses, cannot apply to this system, as there is no escape of steam visible or audible, and the only noise to be distinguished is a rumbling sound like the rattle of the street traffic.

ONE of the most satisfactory reports on the progress of cinchona cultivation and the harvesting of bark in the Government plantations in Bengal, has just been issued by Dr. King. A summary of the work of the year 1879-80 shows that the plantation was extended by about three-quarters of a million of young trees, a crop of 361,590 lbs. of dry bark was harvested, a new kind of cinchona, namely, that which yields the Carthagena bark of commerce, was brought into cultivation, and the nursery stock was maintained at a sufficiently high level for the supply of young plants for the present year. In the details of the year's planting it is shown that as in former years the species most largely planted was *C. succirubra*, and of this as many as 644,222 were put out. Of the valuable *C. calisaya* and hybrid plants a comparatively large number has been planted; of the hybrid species as many as 39,400 at Mungpoo, and 36,680 at Sittong, and of *C. calisaya* 12,782 at Sittong. The yield of bark during the year amounted to 361,590 lbs. of dry bark. Dr. King further reports that in accordance with the orders of Government arrangements were made towards the end of the year for sending a quantity of the Calisaya bark, which had accumulated in the factory store-room, to London for sale, and since the expiry of the year, part of this bark has actually been despatched: further it is stated that the amount of febrifuge used in substitution of quinine in Government hospitals and dispensaries during the past year was 5,400 lbs. Taking the average price in Calcutta of quinine for the year at Rs. 90 per lb. (a low estimate), the saving effected by this substitution has been nearly four lakhs of rupees. The saving in former years from the substitution of the febrifuge having amounted to seven and three quarter lakhs of rupees, the total saving up to the end of last year therefore reaches eleven and three quarter lakhs, which is quite a lakh and a half more than the plantations (including compound interest at 4 per cent.) have cost since their commencement. This is a most satisfactory statement, added to which the introduction through Kew of the valuable species of cinchona, yielding Carthagena or Columbian bark, and the

prospect of its successful propagation, makes Dr. King's present report one of very great interest and satisfaction.

WE have received several numbers for the current year (vol. v.) of the *Botanical Gazette*, a Paper of Botanical Notes published at Crawfordsville, Indiana. The *Gazette* appears to have a large circulation in Western America, which, as far as we can judge from the specimens before us, it well deserves. We quote the following interesting and sensible remarks from the editorial notes:—"A new school of botanists is rapidly gaining ground in this country, and we are glad to see it. While the country was new and its flora but little known, it was very natural for systematic botany to be in the ascendency. It is a very attractive thing to most men to discover new species; but when the chance for such discovery becomes much lessened, there is a turning to the inexhaustible field of physiological botany. Systematists are necessary, but a great number of them is not an essential thing, and it is even better to have but a few entitled to rank as authorities in systematic work. But in studying the life-histories of plants or their anatomical structure, we cannot have too many careful observers. This, at the present day, seems to be the most promising field, and one botanist after another is coming to appreciate it. As microscopes are becoming cheaper, and hence commoner, the workers in the histology of plants are becoming more numerous, and it is to such that the *Gazette* would now address itself." We noticed especially some remarkable observations by a correspondent of the *Gazette* on the carnivorous habits of the honey-bee of South America. These would appear, however, to require confirmation before they can be accepted without hesitation.

THE *Valley Naturalist* is the title of a small monthly journal published in St. Louis, U.S. It contains contributions in various departments of natural science; it would be of more value, we think, if it confined itself more strictly to contributions on local natural history, and had fewer miscellaneous items from foreign journals.

WE noticed a few months ago that an international metrological office had been established at Breteuil (near St. Cloud) at the expense of all the civilised nations except England. A part of the duties of this office is to deliver to the associated nations approved standard metres and kilograms for the ulterior construction of other standards, and practical verification of the usual metres and kilograms. The standards intended for France being ready, the Minister of Public Instruction appointed the French national committee, which is composed of MM. Dumas, St.-Claire Deville, Herve-Mangon, Mascart, and a few others. It may be noted that M. Tresca, who designed the pattern of the international metre adopted by the International Commission, is not one of the new committee.

THE Nineteenth Century Building Society has done a commendable thing in resolving, that as, in their opinion a course of lectures at the Parkes Museum of Hygiene on House Sanitation would be most valuable to the members of building societies (who to a very large extent own the house they live in), the secretary of the society be requested to ask the Committee of the Museum whether such a course of lectures could not be given gratuitously during the ensuing winter.

THE Municipal Council of St. Petersburg is at present deliberating on a proposition made by the Electrotechnik, a Russian society recently established, for illuminating with Siemens lamps the Newsky Prospect, whose length is 7,000 metres.

THE Algerian *Akhbar* says, in one of its last numbers, that the corpses of two European travellers, who according to all probability have died from want of water, have been discovered lying in the desert fifty miles southward of Wargla, the most remote oasis occupied by the French in the Algerian Sahara.

The names and nationality of these two unfortunate travellers have not been ascertained yet, according to our contemporary.

FROM a Japan paper we learn that at the Botanical Garden in Aichi *ken*, an Indian tea-plant, has been planted as an experiment. The leaves have lately been gathered and treated in the same manner as the Uji tea, and it has been found that the product of dried tea is greater in proportion to the quantity of leaves used than in the case of Japanese plants. Tea-growers are, in consequence, said to be devoting their attention to the new plant.

THE additions to the Zoological Society's Gardens during the past week include a Plantain Squirrel (*Sciurus plantani*) from Java, a Smooth Snake (*Coronella levis*) from Hampshire, presented by Mr. D. Tober; a Plantain Squirrel (*Sciurus plantani*) from Java, presented by Mrs. Elliot; a Common Spoonbill (*Platalea leucorodia*), European, presented by Mr. W. H. St. Quintin; a Common Kestrel (*Tinnunculus alaudarius*), European, presented by Mr. J. Young; two Central American Agoutis (*Dasyprocta isthmica*) from Central America, a Variable Squirrel (*Sciurus variabilis*), a Common Boa (*Boa constrictor*) from South America, two West African Pythons (*Python sebae*) from West Africa, a European Pond Tortoise (*Emys europæus*), European, two Glass Snakes (*Pseudopus pallasi*), a Lacertine Snake (*Coleophyllus lacertina*), a Common Snake (*Tropidonotus natrix*-var.), South European, deposited; a Fraser's Squirrel (*Sciurus stramineus*) from Ecuador, a Ring-tailed Coati (*Nasua rufa*), a Cayenne Lapwing (*Vanellus cayennensis*) from South America, three Californian Quails (*Callipepla californica*), purchased; two Gayals (*Bibos frontalis*) from Assam, two Sumatran Porcupines (*Hystrix longicauda*) from Sumatra, an Indian Crocodile (*Crocodilus palustris*) from India, received in exchange.

OUR ASTRONOMICAL COLUMN

HARTWIG'S COMET.—Prof. Winnecke, in a circular issued from Strassburg on October 5, expresses the opinion that it is highly probable the comet discovered by Dr. Hartwig on September 29 was observed in the year 1506, and at his request Dr. Hartwig has submitted the point to calculation, using the first approximation to the orbit which we gave last week. Laugier computed elements of the comet of 1506, from the rough accounts left by European chroniclers and one in the Chinese annals, but his places were necessarily very arbitrarily fixed in this case, as may be seen on referring to his communication presented to the Academy of Sciences at Paris on January 26, 1846. It has not been consequently from any striking similarity between the orbits that Prof. Winnecke has been led to conjecture the identity of the comets, but rather, it would appear, from a general resemblance of track, allowance being made for the somewhat later appearance in the year of the comet of 1880. The Chinese observations do certainly in some cases enable us to make reliable approximations to the orbits of comets, as, for instance, in 568 and 1337; indeed for the latter comet they furnish a remarkably good outline of its apparent path, considering the difficulties which in many cases attend the interpretation of the Chinese accounts: nevertheless for the great majority of comets recorded in their annals the descriptions are unfortunately totally insufficient for this purpose, one very common failing being the omission of dates corresponding to the positions given, as for the comet of A.D. 178, which must have passed very near the earth from the long track it described in the heavens.

As regards European observations of the comet of 1506, Pingré tells us (on the authority of the Chronicles which, according to his excellent custom, are named in his margins), that a comet was seen in the month of August in the north, or between the north and east, or lastly between the west and north, and as the comet was not distant from the Pole, so that it appeared in the evening after sunset, and in the morning before sunrise, it may have had at different hours of the night the various positions mentioned by the historians. It had a long and bright tail which extended "between the fore and hind-wheels of the chariot." On August 8 a Polish historian, an eye-witness, says it was seen near the Pole above "the seven stars or the stars of the great chariot;" on the following night it was

situated amongst the same stars, and later, on several nights, it was seen below them; declining by the signs Cancer, Leo, and Virgo, it attained the northern part of the horizon and disappeared on August 14. Some writers limit its appearance to eight days; others say it was visible for three weeks, or even a month.

With respect to Chinese observations, Pingré quotes from Gaubil's manuscript, of which he made so much use, which was preserved in the Dépôt de la Marine at Paris in his time, but since understood to be lost, and from Mailla and Couplet. We have now the fuller translations by Biot and Williams. We read that in the first year of the epoch Ching Tih, in the reign of Woo Tsung, on the day Ke Chow of the 7th moon (1506, July 31), a star was seen to the west without the boundary of Tsze Wei (the circle of perpetual apparition). . . . After some days it had a short tail. It was seen between the sidereal divisions Tsan (determined by δ Orionis) and Tsing (by μ Geminorum), the Chinese sidereal divisions, it must be remembered, being intervals of right ascension with wide limits of declination reckoned from the determining star of the division, which we have here taken from Biot. It gradually lengthened, extending in a north-westerly direction towards or to Wan Chang (θ , α , ϕ Ursæ Majoris). On August 10 it was bright, and moved to the south-east, it lengthened to about 5° and swept the upper of the stars Hea Tae (ν , ξ , Ursæ Majoris), and entered within the space Tae Wei Yuen (Biot's *Thai-Wa*), a space between stars in Leo and Virgo, to which, as also to Tsze Wei, the circle of perpetual apparition mentioned above, constant reference is made in the Chinese cometary observations. For the limits of this space Williams may be consulted. Biot and he substantially agree in their translations. Dr. Hartwig assumes the perihelion passage in 1506 to have occurred on July 1, old style, and with the elements of 1880 finds a track of which it is remarked, "Die Uebereinstimmung des so gefundenen Laufes mit dem wirklich beobachteten ist eine vollständige." The track is thus given:—

	R.A.	Decl.		R.A.	Decl.
July 19 ...	97° 1'	+39° 3'	Aug. 18 ...	250° 1'	+54° 5'
29 ...	106° 6'	61° 3'	28 ...	258° 1'	37° 0'
Aug. 8 ...	201° 9'	77° 9'			

We should incline to characterise the presumed identity of the comets of 1506 and 1880 as one rather of possibility than of high probability.

From observations at Strassburg on September 29 and October 1, and one at Leipzig on October 3, Mr. Hind has deduced the following elements:—

Perihelion passage, September 6^g 182 G.M.T.

Longitude of perihelion	81° 1' 37"	} App. Eq.
„ ascending node	44 19 47	
Inclination of orbit	38 28 11	} Oct. 1.
Logarithm of perihelion distance	9° 558048	
Motion—retrograde.		

As regards position the comet may be observed for many weeks, but the brightness will be rapidly declining. Since it was not detected till three weeks after perihelion passage, it is desirable that observations should be continued as long as practicable, if the character of the orbit is to be decided at this appearance.

GEOGRAPHICAL NOTES

THE newly published volume of the Geographical Society's *Journal* contains some useful and even valuable contributions to geography. The veteran traveller, Capt. R. F. Burton, furnishes a memoir respecting the new map of Midian constructed by the officers of the Egyptian General Staff. Capt. Burton however, as might be expected, supplies geographical information beyond that given by the Egyptian officers. He also contributes a second paper of a different character on the subject of a visit to Lissa and Pelagosa. Even more valuable than Capt. Burton's first paper is Lieut. R. C. Temple's account of the country traversed by the second column of the Tal-Chotiali field-force in the spring of 1879, with his sketch-map of part of the country passed over by it between Candahar and India. This memoir has evidently been drawn up with elaborate care, and embodies a mass of important information. The notes upon some astronomical observations made in Kordofan and Darfur